

CURRICULUM VITAE

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PROFESSIONAL EXPERIENCE

1998–present Senior Scientist
Pacific Marine Environmental Laboratory, Seattle, Washington

1993–present Affiliate Professor, School of Oceanography, University of Washington

1992–present Director, TAO Project Office
Pacific Marine Environmental Laboratory, Seattle, Washington

1992–1998 Supervisory Oceanographer GM-15, Pacific Marine Environmental
Laboratory, Seattle, Washington

1991–1992 Oceanographer, GS-15, Pacific Marine Environmental Laboratory, Seattle,
Washington

1990–present Senior Fellow, Joint Institute for the Study of the Atmosphere and Ocean,
University of Washington

1990–1993 Affiliate Associate Professor, School of Oceanography, University of
Washington

1988–1990 Affiliate Assistant Professor, School of Oceanography, University of
Washington

1987–present Senior Fellow, Joint Institute for Marine and Atmospheric Research,
University of Hawaii

1986–1991 Oceanographer GS-14, Pacific Marine Environmental Laboratory, Seattle,
Washington

1984–1986 Research Assistant Professor, School of Oceanography, University of
Washington

1982–1984 Visiting Research Scientist, Joint Institute for the Study of the Atmosphere
and Ocean, University of Washington

1980–1982 Research Scientist, Oceanography Section, National Center for Atmospheric
Research

EDUCATION

1980 Scripps Institution of Oceanography, Ph.D., Physical Oceanography: Dissertation
title: “Models of the Equatorial Ocean Circulation”

1973 State University of New York at Buffalo, B.S., Physics, magna cum laude

HONORS AND AWARDS

Guest Professor, Ocean University of China, 2006

Fellow, the Oceanography Society, 2005

Scientific American “Science & Technology Web Awards” for El Niño Theme Page, 2005

Presidential Rank Award for Meritorious Federal Service, 2004

Listed in Thomson ISI Highly Cited Researchers in Geosciences, 2004

Grace Hopper Government Technology Award (“Gracie Award”), given to the TAO project for
Leadership in the Innovative Application of Information Technology, 2003

American Geophysical Union, Frontiers of Geophysics Lecturer, 2002 Western Pacific
Geophysics Meeting

American Meteorological Society, Walter Orr Roberts Lecturer, 2002

American Meteorological Society, Special Award for Completing and Maintaining the TAO
Array, 1999

Public Service Award, Federal Executive Board, Seattle, 1999

American Geophysical Union, Sverdrup Lecturer, Fall 1998 Meeting

Department of Commerce, Gold Medal, 1997

Editor's Citation for Excellence in Refereeing, *Journal of Geophysical Research*, 1995
NOAA/OAR Outstanding Publication Award, 1999, 2000, 2002, 2004
NOAA/PMEL Outstanding Publication Award, 1989–1993, 1995, 1997, 1998
Who's Who in Science and Engineering
Who's Who in the World
Who's Who in the West
Phi Beta Kappa

PROFESSIONAL SOCIETIES

Marine Technology Society/IEEE, 1990
The Oceanography Society, 1988–present
American Geophysical Union, 1979–present
The American Meteorological Society, 1978–present
The European Geosciences Union, 2005–present

PROFESSIONAL SERVICE ACTIVITIES

Convener, IUGG Symposium on Interannual to Interdecadal Climate Variability, 2007
Member, RAPID (Rapid Climate Change) Review Committee, February 2007
Member, Review Committee, Cooperative Institute for Climate and Ocean Research (CICOR),
June 2005
President, Ocean Sciences Section, American Geophysical Union, 2002–2004
Member, Executive Committee, AGU Ocean Sciences Section, 2000–present
Member, IOC/WMO Joint Commission on Oceanography and Marine Meteorology,
observations Coordination Group, 2001–present
Member, International CLIVAR Global Synthesis and Observations Panel, 2004–present
Member, International CLIVAR Indian Ocean Panel, 2003–present
Member, International CLIVAR Pacific Ocean Panel, 2001–present
Chairman, Tropical Moored Buoy Implementation Panel, 2001–present
Member, International CLIVAR/OOPC OceanSITES Working Group, 2000–present
Editorial Board, Bulletin of the American Meteorological Society, 2001–present
Member, PIRATA Steering Group, 1995–present
Member, International CLIVAR Ocean Observations Panel, 2000–2003
Member, OCEANOBS99 Conference Steering Committee, 1999
Member, AMS Committee on the Interaction of the Sea and the Atmosphere, 1999–2002
Member, O-CLIVAR Steering Group, 1996–1997
Member, Nominations Committee, The Oceanography Society, 1994–1996
Chairman, Pan American Climate Studies Subcommittee on Observations, 1994–1996
Member, Organizing Committee, Final TOGA Conference, 1994–1995
Chairman, TAO Implementation Panel, 1992–2001
Member, Ocean Observing System Development Panel, 1992–1994
Member, International TOGA Scientific Steering Group, 1992–1994
Member, National Academy of Science Advisory Panel on Near-term Development of
Operational Ocean Observations, 1991–1993
Member, WCRP Pacific Panel, 1990–1994
Member, International TOGA Scientific Steering Group Ad Hoc Committee on Moored current
Measurements, 1989
Member, WOCE Moored Measurements Implementation Panel, 1988–1991
Member, EPOCS Council, 1987–1994
Convener, The ENSO Event of 1986–1987 Fall AGU, San Francisco, 1987
Member, US/PRC bilateral air-sea interaction planning committee, 1986–1992
Member, WOCE Committee on Surface Layer Observations, 1986–1988
Convener, Equatorial Undercurrent Centennial Conference, Fall AGU, San Francisco, 1986
Co-Convener, Second International TOGA Workshop on Thermal Sampling, Hobart, Australia,
November 1986
Convener, TOGA Thermal Data Center Workshop, Monterey, California, July 1985
Consultant, CCCO Pacific, Atlantic, and Indian Ocean Panels, 1984–1990
Co-Chairman, Pacific Subsurface Thermal Field Monitoring Steering Group 1984–1987

Member, U.S. Delegation to India, Indo-U.S. bilateral on monsoon variability, Bangalore, India, 1984
Co-Convener, Pacific Subsurface Thermal Field Monitoring Workshop, Seattle, 1984
Member, TOGA Pacific Drafting Workshop, Miami, 1983
Convener, Special Ocean/Atmospheric Sciences session on El Niño 1982–1983, Fall AGU Meeting, San Francisco, 1983
Member, Navy/NOAA Committee on Observational Strategies for Ocean Monitoring, Miami, 1983
Consultant, FOCAL/SEQUAL Programs, 1982–1986
Member, Tropic Heat Experiment Executive Committee, 1981–1982
Consultant, CAGE Feasibility Study Committee, 1981–1982
Member, Equatorial Theoretical Panel, 1978–1984

STUDENT RESEARCH SUPPORT

Natalia Stefanova	2005–
Xuebin Zhang	2002–
Weimin Wang	1994–2000
Xuri Yu	1991–1999
Rusty Brainard	1991–1994
Ken Duvall	1987
Scott Springer	1986–1989
Mary Landsteiner	1985–1987
Jeff Proehl	1984–1988

STUDENT COMMITTEES

University of Washington

Jeff Proehl, Ph.D. (Chairman)
Mary Landsteiner, M.S. (Chairman)
Scott Springer, M.S. (Chairman), Ph.D.
Xuri Yu, Ph.D. (Chairman)
Weimin Wang, Ph.D. (Chairman)
Xuebin Zhang, Ph.D. (Chairman)
Natalia Stefanova, Ph.D. (Chairman)
William Kessler, Ph.D.
David Battisti, Ph.D.
Keith Brainard, Ph.D.
Joanna Meunch, Ph.D.
Chuanli Jiang, Ph.D.

Naval Postgraduate School
Rusty Brainard, Ph.D.

University of Paris - VI
Christophe Menkes, Ph.D.
Lucia Bunge, Ph.D.

University of Toulouse - III
Sophie Cravatte, Ph.D.
Takeshi Izumo, Ph.D.
Christelle Bosc, Ph.D.

University of Maryland
Gregory Foltz, Ph.D.

POSTDOC SUPPORT AND SUPERVISION

Regina Rodrigues	2005–2007
Greg Foltz	2003–2006
Dongxiao Zhang	1999–2001

Weimin Wang	2000
Xuri Yu	1999
Chris Meinen	1998–2000
Kenong Bi	1995–1996
Meghan Cronin	1993–1995
Janet Sprintall	1992–1993
Eric Johnson	1990–1992

OCEANOGRAPHIC RESEARCH CRUISES

- NOAA Ship *Ka'imimoana*, 10-23 September 2006, Nuku Hiva, French Polynesia to Honolulu, Hawaii (Chief Scientist)
- NOAA Ship *Ka'imimoana*, 5-27 April 2005, San Diego, CA to Galapagos Islands, Ecuador
- NOAA Ship *Ka'imimoana*, 1-23 March 2002, Honolulu, HI to Galapagos Islands, Ecuador (Chief Scientist)
- NOAA Ship *Ka'imimoana*, 27 September-15 October 1997, San Diego, CA to Nuku Hiva, French Polynesia (Chief Scientist)
- RV *Le Noroit*, 2-18 February 1992, Kwajalein, Marshall Islands to Noumea, New Caledonia
- RV *Le Noroit*, 26 March-4 April 1991, Kwajalein, Marshall Islands to Noumea, New Caledonia
- NOAA Ship *Malcolm Baldrige*, 20 April-22 May 1990, Honolulu, HI to Rodman, Panama (Chief Scientist)
- Xiangyanghong #14*, 12-28 October 1987, Pohnpei, Micronesia to Republic of Nauru
- NOAA Ship *Oceanographer*, 17 October-10 November 1986, Seattle, WA to Manzanillo, Mexico (Chief Scientist)
- RV *Marion Dufresne*, May-July 1983, Dakar, Senegal to La Reunion

REFEREED PUBLICATIONS

- Cheng, W., M.J. McPhaden, D. Zhang, and E.J. Metzger, 2007: Recent changes in the Pacific subtropical cells inferred from an eddy resolving ocean circulation model. *J. Phys. Oceanogr.*, *37*, 1340-1356.
- Delcroix, T., S. Cravatte, and M.J. McPhaden, 2007: Decadal variations and trends in tropical Pacific sea surface salinity since 1970. *J. Geophys. Res.*, *112*(C3), C03012, doi:10.1029/2006JC003801.
- Foltz, G.R. and M.J. McPhaden, 2007: Seasonal mixed layer salinity balance of the tropical North Atlantic Ocean. *J. Geophys. Res.*, in press.
- McPhaden, M.J., 2007: El Niño and La Niña: Physical Mechanisms and Climate Impacts. In: The Impact of Environmental Variability on Ecological Systems. D. A. Vasseur and K. S. McCann (Eds.). Springer, New York, p. 1-16.
- Yoneyama, K. et al, 2007: MISMO field experiment in the tropical Indian Ocean. *Bull. Am. Meteor. Soc.*, submitted.
- Behrenfeld, M.J., K. Worthington, R.M. Sherrell, F.P. Chavez, P. Strutton, M.J. McPhaden, and D.M. Shea, 2006: Controls on tropical Pacific ocean productivity revealed through nutrient stress diagnostics. *Nature*, *442*, 1025-1028.
- Bennett, A.F., B.S. Chua, H.-E. Ngodock, D.E. Harrison, and M.J. McPhaden, 2006: Generalized inversion of the Gent-Cane model of the Tropical Pacific with Tropical Atmosphere-Ocean (TAO) data. *J. Mar. Res.*, *64*, 1-42.
- Cronin, M.F., C. Fairall, and M.J. McPhaden, 2006: An assessment of buoy derived and numerical weather prediction surface heat fluxes in the tropical Pacific. *J. Geophys. Res.*, *111*, C06038, doi:10.1029/2005JC003324.

- Feely, R.A., T. Takahashi, R. Wanninkhof, M.J. McPhaden, C.E. Cosca, S.C. Sutherland and M.-E. Carr, 2006: Decadal Variability of the Air-Sea CO₂ Fluxes in the Equatorial Pacific Ocean. *J. Geophys. Res.*, *111.*, C08S90, doi:10.1029/2005JC003129.
- Foltz, G.R. and M.J. McPhaden, 2006: Unusually warm sea surface temperatures in the tropical North Atlantic during 2005. *Geophys. Res. Lett.*, *33*, L19703, doi:10.1029/2006GL027394.
- Foltz, G.R. and M.J. McPhaden, 2006: The role of oceanic heat advection in the evolution of tropical North and South Atlantic SST anomalies. *J. Climate*, *19*, 6122-6138.
- Maes, C., K. Ando, T. Delcroix, W.S. Kessler, M.J. McPhaden, and D. Roemmich, 2006: Observed correlation of surface salinity, temperature and barrier layer at the eastern edge of the western Pacific warm pool. *Geophys. Res. Lett.*, *33*, L06601, doi:10.1029/2005GL024772.
- McPhaden, M.J., S.E. Zebiak, and M.H. Glantz, 2006: ENSO as an integrating concept in Earth science. *Science*, *314*, 1740-1745.
- McPhaden, M.J., X. Zhang, H.H. Hendon, and M.C. Wheeler, 2006: Large Scale Dynamics and MJO Forcing of ENSO Variability. *Geophys. Res. Lett.*, *33*(16), L16702, doi:10.1029/2006GL026786.
- Rodrigues, R.R., M.J. McPhaden, and D. Zhang (2006): Decadal variability of the shallow overturning cells in the Pacific and Atlantic Oceans. *J. Phys. Oceanogr.*, (submitted).
- Schein, K.A. et al, 2006: The state of the climate 2005. *Bull. Am. Meteorol. Soc.*, *87*, S1-S102.
- Zhang, D., and M.J. McPhaden, 2006: Decadal variability of the shallow Pacific meridional overturning circulation: relation to tropical sea surface temperatures in observations and climate change models. *Ocean Modelling*, in press.
- Zhang, X. and M.J. McPhaden, 2006: Wind stress variations and interannual sea surface temperature anomalies in the eastern equatorial Pacific. *J. Climate*, *19*, 226-241.
- Capotondi, A., M.A. Alexander, C. Deser, and M.J. McPhaden, 2005: Anatomy and Decadal Evolution of the Pacific Subtropical-Tropical Cells (STCs). *J. Climate*, *18*, 3739-3758.
- Delcroix, T., M.J. McPhaden, A. Dessier, and Y. Gouriou, 2005: Time and space scales for sea surface salinity in the tropical oceans. *Deep-Sea Res.*, *52*, 787-813.
- Foltz, G.R. and M.J. McPhaden, 2005: Mixed layer heat balance on intraseasonal time scales in the northwestern tropical Atlantic Ocean. *J. Climate*, *18*, 4168-4184.
- Grodsky, S.A., J.A. Carton, C. Provost, J. Servain, J. A. Lorenzetti, and M.J. McPhaden, 2005: Tropical instability waves at 0°N, 23°W in the Atlantic: A case study using Pilot Research Moored Array in the Tropical Atlantic (PIRATA) mooring data. *J. Geophys. Res.*, *110*, C08010, doi:10.1029/2005JC002941.
- Levinson, D.H. et al, 2005: State of the Climate in 2004. *Bull. Am. Meteor. Soc.*, *86*(6), S1-S86.
- Cai, W. M.J. McPhaden, and M.A. Collier, 2004: Multidecadal fluctuations in the relationship between equatorial Pacific heat content anomalies and ENSO amplitude. *Geophys. Res. Lett.*, *31*, L01201, doi:10.1029/2003GL018714.

- Foltz, G.R., S.A. Grodsky, J.A. Carton, and M.J. McPhaden, 2004: Seasonal salt budget of the northwestern tropical Atlantic Ocean along 38°W. *J. Geophys. Res.*, 109(C3), C03052, doi:10.1029/2003JC002111.
- Foltz, G.R. and M.J. McPhaden, 2004: 30-70 day oscillations in the tropical Atlantic. *Geophys. Res. Lett.*, 31, L15205, doi:10.1029/2004GL020023.
- McPhaden, M.J., 2004: Evolution of the 2002–03 El Niño. *Bull. Am. Meteor. Soc.*, 85, 677–695.
- McPhaden, M.J. and D. Zhang, 2004: Pacific Ocean circulation rebounds. *Geophys. Res. Lett.*, 31, L18301, doi:10.1029/2004GL020727.
- Rajeevan, M. and M.J. McPhaden, 2004: Tropical Pacific upper ocean heat content variations and Indian summer monsoon rainfall. *Geophys. Res. Lett.*, 31, L18203, doi:10.1029/2004GL020631.
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- Cosca, C.E., R.A. Feely, R. Wanninkhof, J. Boutin, J. Etcheto, and M.J. McPhaden, 2003: Seasonal and interannual variations of fCO₂-SST relationships for the central and eastern equatorial Pacific. *J. Geophys. Res.*, 108(C8), 3278, doi:10.1029/2000JC000677.
- Foltz, G.R., S.A. Grodsky, J.A. Carton, and M.J. McPhaden, 2003: Seasonal mixed layer heat budget of the tropical Atlantic Ocean. *J. Geophys. Res.*, 108(C5), 3146, doi:10.1029/2002JC001584.
- McPhaden, M.J., 2003: Tropical Pacific Ocean heat content variations and ENSO persistence barriers. *Geophys. Res. Lett.*, 30(9), 1480, doi:10.1029/2003GL016872.
- Scavia, D., M.P. Sissenwine, H.L. Dantzler, M.J. McPhaden, P.F. Moersdorf, 2003: NOAA's ocean observing programs. *Oceanography*, 16, 61–67.
- Serra, Y.L. and M.J. McPhaden, 2003: Multiple time space comparisons of ATLAS buoy rain gauge measurements to TRMM satellite precipitation measurements. *J. Appl. Meteorol.*, 42, 1045–1059.
- Zhang, D., M.J. McPhaden, and W.E. Johns, 2003: Observational evidence for flow between the subtropical and tropical Atlantic: The Atlantic subtropical cells. *J. Phys. Oceanogr.*, 33, 1783–1797.
- Cronin, M.F. and M.J. McPhaden, 2002: Barrier layer formation during westerly wind bursts. *J. Geophys. Res.*, 107(C12), 8020, doi:10.1029/2001JC001171.
- Cronin, M.F., N. Bond, C. Fairall, J. Hare, M.J. McPhaden, and R.A. Weller, 2002: Enhanced Oceanic and Atmospheric Monitoring for the Eastern Pacific. *Eos Trans. AGU*, 83, 205.
- Delcroix, T. and M.J. McPhaden, 2002: Interannual sea surface salinity and temperature changes in the western Pacific warm pool during 1992–2000. *J. Geophys. Res.*, 107(C12), 8002, doi:10.1029/2001JC000862.
- Feely, R.A., J. Boutin, C.E. Cosca, Y. Dandonneau, J. Etcheto, H.Y. Inoue, M. Ishii, C.L. Quééré, D. Mackey, M.J. McPhaden, N. Metzl, A. Poisson, and R. Wanninkhof, 2002: Seasonal and interannual variability of CO₂ in the equatorial Pacific. *Deep-Sea Res.*, 49, 2443–2469.
- Kutsuwada, K. and M.J. McPhaden, 2002: Intraseasonal variations in the upper equatorial Pacific Ocean prior to and during the 1997–98 El Niño. *J. Phys. Oceanogr.*, 32, 1133–1149.

- Lien, R.-C., E.D. D'Asaro, and M.J. McPhaden, 2002: Internal waves and turbulence in the upper central equatorial Pacific: Lagrangian and Eulerian observations. *J. Phys. Oceanogr.*, *32*, 2619–2639.
- Maes, C., M.J. McPhaden, and D. Behringer, 2002: Signatures of salinity variability in tropical Pacific Ocean dynamic height anomalies. *J. Geophys. Res.*, *107*(C12), 8012, doi:10.1029/2000JC000737.
- McPhaden, M.J., 2002: Mixed layer temperature balance on intraseasonal time scales in the equatorial Pacific Ocean. *J. Climate*, *15*(18), 2632–2647.
- McPhaden, M.J. and D. Zhang, 2002: Slowdown of the meridional overturning circulation in the upper Pacific Ocean. *Nature*, *415*, 603–608.
- Medavaya, M., D.E. Waliser, R.A. Weller, and M.J. McPhaden, 2002: Assessing ocean buoy shortwave observations using clear-sky model calculations. *J. Geophys. Res.*, *107*(C2), 3014, doi:10.1029/2000JC000558.
- Thum, N., S.K. Esbensen, D.B. Chelton, and M.J. McPhaden, 2002: Air-sea heat exchange along the Northern Sea surface temperature front in the eastern tropical Pacific. *J. Climate*, *15*(23), 3361–3378.
- Chelton, D.B., S.K. Esbensen, M.G. Schlax, N. Thum, M.H. Freilich, F.J. Wentz, C.L. Gentemann, M.J. McPhaden, and P.S. Schopf, 2001: Observations of coupling between surface wind stress and sea surface temperature in the eastern tropical Pacific. *J. Climate*, *14*, 1479–1498.
- Dickinson, S., K.A. Kelly, M.J. Caruso, and M.J. McPhaden, 2001: A note on comparisons between TAO buoy and NASA scatterometer wind vectors. *J. Atmos. Oceanic Technol.*, *18*, 799–806.
- Godfrey, J.S., G.C. Johnson, M.J. McPhaden, G. Reverdin, and S. Wijffels, 2001: The Tropical Ocean Circulation. In: *Ocean Circulation and Climate - Observing and Modelling the Global Ocean*, G. Siedler, J. Church, and W.J. Gould, eds., *Academic Press*, 215–246.
- Johnson, G.C., M.J. McPhaden, and E. Firing, 2001: Equatorial Pacific Ocean horizontal velocity, divergence, and upwelling. *J. Phys. Oceanogr.*, *31*, 839–849.
- Kelly, K.A., S. Dickinson, M.J. McPhaden, and G.C. Johnson, 2001: Ocean currents evident in satellite wind data. *Geophys. Res. Lett.*, *28*, 2469–2472.
- McPhaden, M.J., T. Delcroix, K. Hanawa, Y. Kuroda, G. Meyers, J. Picaut, and M. Swenson, 2001: The El Niño/Southern Oscillation (ENSO) Observing System. In: *Observing the Ocean in the 21st Century*. Australian Bureau of Meteorology, Melbourne, Australia, 231–246.
- Meinen, C.S. and M.J. McPhaden, 2001: Interannual variability in warm water volume transports in the equatorial Pacific during 1993–1999. *J. Phys. Oceanogr.*, *31*, 1324–1345.
- Meinen, C.S., M.J. McPhaden, and G.C. Johnson, 2001: Vertical velocities and transports in the equatorial Pacific during 1993–1999. *J. Phys. Oceanogr.*, *31*, 3230–3248.
- Nowlin, Jr., M. Briscoe, W.D., N. Smith, M.J. McPhaden, D. Roemmich, P. Chapman, and J.F. Grassle, 2001: Evolution of a sustained ocean observing system. *Bull. Am. Meteorol. Soc.*, *82*, 1368–1376.

- Serra, Y.L., P.A'Hearn, H.P. Freitag, and M.J. McPhaden, 2001: ATLAS self-siphoning rain gauge error estimates. *J. Atmos. Oceanic Technol.*, 18, 1989–2002.
- Turk, D., M.J. McPhaden, M.R. Lewis, and A.J. Busalacchi, 2001: Remotely-sensed biological production in the Tropical Pacific during 1992–1999. *Science*, 293, 471–474.
- Vialard, J., C. Menkes, J.-P. Boulanger, P. Delecluse, E. Guilyardi, M.J. McPhaden, and G. Madec, 2001: A model study of oceanic mechanisms affecting equatorial Pacific sea surface temperature during the 1997–98 El Niño. *J. Phys. Oceanogr.*, 31, 1649–1675.
- Wang, W. and M. J. McPhaden, 2001: Surface layer heat balance in the equatorial Pacific Ocean during the 1997–98 El Niño and the 1998–99 La Niña. *J. Climate*, 14, 3393–3407.
- Wang, W. and M.J. McPhaden, 2001: What is the mean seasonal cycle of surface heat flux in the equatorial Pacific?. *J. Geophys. Res.*, 106, 837–857.
- Bennett, A.F., B.S. Chua, D.E. Harrison, and M.J. McPhaden, 2000: Generalized inversion of Tropical Atmosphere-Ocean (TAO) data and a coupled model of the tropical Pacific, II: La Niña, error statistics, and array assessment. *J. Climate*, 13, 2770–2785.
- Cronin, M.F., M.J. McPhaden, and R.H. Weisberg, 2000: Wind forced reversing currents in the western equatorial Pacific. *J. Phys. Oceanogr.*, 30, 657–676.
- Johnson, G.C., M.J. McPhaden, G.D. Rowe, and K.E. McTaggart, 2000: Upper equatorial Pacific ocean current and salinity variability during the 1996–98 El Niño-La Niña cycle. *J. Geophys. Res.*, 105, 1037–1053.
- Meinen, C.S. and M.J. McPhaden, 2000: Observations of warm water volume changes in the equatorial Pacific and their relationship to El Niño and La Niña. *J. Climate*, 13, 3551–3559.
- Nystuen, J.A., M.J. McPhaden, and H.P. Freitag, 2000: Surface measurements of precipitation from an ocean mooring: The underwater acoustic log from the South China Sea. *J. Appl. Meteorol.*, 39, 2182–2197.
- Wang, W. and M.J. McPhaden, 2000: The surface layer heat balance in the equatorial Pacific Ocean. Part II: Interannual variability. *J. Phys. Oceanogr.*, 30, 2989–3008.
- Zhang C. and M.J. McPhaden, 2000: Intraseasonal surface cooling in the equatorial western Pacific. *J. Climate*, 13, 2261–2276.
- Chavez, F.P., P.G. Strutton, G.E. Friederich, R.A. Feely, G.C. Feldman, D.G. Foley, and M.J. McPhaden, 1999: Biological and chemical response of the equatorial Pacific Ocean to the 1997-1998 El Niño. *Science*, 286, 2126–2131.
- Cronin, M.F. and M.J. McPhaden, 1999: Diurnal cycle of rainfall and sea surface salinity in the western Pacific warm pool. *Geophys. Res. Lett.*, 26, 3465–3468.
- Johnson, G.C. and M.J. McPhaden, 1999: Interior pycnocline flow from the subtropical to the equatorial Pacific Ocean. *J. Phys. Oceanogr.*, 29, 3073–3089.
- McPhaden, M.J., 1999: Genesis and evolution of the 1997–98 El Niño. *Science*, 283, 950–954.
- McPhaden, M.J. and X. Yu, 1999: Equatorial waves and the 1997–98 El Niño. *Geophys. Res. Lett.*, 26, 2961–2964.
- Wang, W. and M.J. McPhaden, 1999: The surface layer heat balance in the equatorial Pacific Ocean, Part I: Mean seasonal cycle. *J. Phys. Oceanogr.*, 29, 1812–1831.

- Yu, X. and M.J. McPhaden, 1999: Seasonal variability in the equatorial Pacific. *J. Phys. Oceanogr.*, 29, 925–947.
- Yu, X. and M.J. McPhaden, 1999: Dynamical analysis of seasonal and interannual variability in the equatorial Pacific. *J. Phys. Oceanogr.*, 29, 2350–2369.
- Bennett, A.F., B.S. Chua, D.E. Harrison, and M.J. McPhaden, 1998: Generalized inversion of Tropical Atmosphere-Ocean data and a coupled model of the tropical Pacific. *J. Climate*, 11, 1768–1792.
- Chavez, F.P., P.G. Strutton, and M.J. McPhaden, 1998: Biological-physical coupling the central equatorial Pacific during the onset of the 1997–98 El Niño. *Geophys. Res. Lett.*, 25, 3543–3546.
- Cronin, M.F. and M.J. McPhaden, 1998: Upper ocean salinity balance in the western equatorial Pacific. *J. Geophys. Res.*, 103, 27,567–27,589.
- McPhaden, M.J., A.J. Busalacchi, R. Cheney, J.R. Donguy, K.S. Gage, D. Halpern, M. Ji, P. Julian, G. Meyers, G.T. Mitchum, P.P. Niiler, J. Picaut, R.W. Reynolds, N. Smith, and K. Takeuchi, 1998: The Tropical Ocean-Global Atmosphere (TOGA) observing system: A decade of progress. *J. Geophys. Res.*, 103, 14,169–14,240.
- Servain, J., A.J. Busalacchi, M.J. McPhaden, A.D. Moura, G. Reverdin, M. Vianna, and S.E. Zebiak, 1998: A Pilot Research Moored Array in the Tropical Atlantic (PIRATA). *Bull. Am. Meteorol. Soc.*, 79(10), 2019–2031.
- Ando, K. and M.J. McPhaden, 1997: Variability of surface layer hydrography in the tropical Pacific Ocean. *J. Geophys. Res.*, 102, 23,063–23,078.
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